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FORM PTO-1390 (REV. 5-93)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 097743668	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)					
INTERNATIONAL APPLICATION NO. PCT/EP99/04665		INTERNATIONAL FILING DATE 05 July 1999		PRIORITY DATE CLAIMED 15 July 1998	
TITLE OF INVENTION RADIO COMMUNICATIONS UNIT					
APPLICANT(S) FOR DO/EO/US Robert Owen BRISTOW					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.					
2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.					
3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).					
4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.					
5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))					
a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).					
b. <input type="checkbox"/> has been transmitted by the International Bureau.					
c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)					
6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).					
7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))					
a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).					
b. <input type="checkbox"/> have been transmitted by the International Bureau.					
c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.					
d. <input type="checkbox"/> have not been made and will not be made.					
8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).					
9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))					
10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).					
Items 11. to 16. below concern other document(s) or information included:					
11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.					
12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.					
13. <input type="checkbox"/> A FIRST preliminary amendment.					
<input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.					
14. <input type="checkbox"/> A substitute specification.					
15. <input type="checkbox"/> A change of power of attorney and/or address letter.					
16. <input checked="" type="checkbox"/> Other items or information:					
COPY OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT;					
COPY OF THE INTERNATIONAL SEARCH REPORT;					
COPY OF THE PCT REQUEST; AND					
CONFIRMATION POSTCARD.					

CERTIFICATE OF MAILING BY EXPRESS MAIL

"EXPRESS MAIL" Mailing Label No. EL654514190USDate of Deposit: January 10, 2001

I hereby certify that this paper or fee is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.110 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231

Type or Print Name: Dorothy MacKinnon

Signature

U.S. APPLICATION NO. (if known, use 37 CFR 1.52) 097743668		INTERNATIONAL APPLICATION NO. PCT/EP99/04665		ATTORNEY'S DOCKET NUMBER 29206-00030	
17. <u>X</u> The following fees are submitted:				CALCULATIONS	
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO \$40.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) \$670.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$730.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1000.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$96.00 ENTER APPROPRIATE BASIC FEE AMOUNT = \$ 1000				PTO USE ONLY	
Surcharge of \$130.00 for furnishing the oath or declaration later than <u>20</u> <u>30</u> months from the earliest claimed priority date (37 CFR 1.492(e)).					
Claims	Number Filed	Number Extra	Rate		
Total Claims	21 - 20 =	1	x \$18.00	\$ 18	
Independent Claims	2 - 3 =	0	x \$80.00	\$	
Multiple dependent claims(s) (if applicable)			+ \$270.00	\$ 270	
TOTAL OF ABOVE CALCULATIONS =				\$ 1288	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$ 1288	
Processing fee of \$130.00 for furnishing the English translation later the <u>20</u> <u>30</u> months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 1288	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED =				\$ 1288	
				Amount to be: refunded	\$
				charged	\$
a. <u>X</u> A check in the amount of \$ <u>1288.00</u> to cover the above fees is enclosed. b. <u> </u> Please charge my Deposit Account No. <u>10-0447</u> in the amount of \$ <u> </u> to cover the above fees. A duplicate copy of this sheet is enclosed. c. <u>X</u> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>10-0447</u> . A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:					
Stanley R. Moore, Esq. Jenkins & Gilchrist, P.C. 3200 Fountain Place 1445 Ross Avenue Dallas, Texas 75202-2798 214/956-4500					
				SIGNATURE Stanley R. Moore	
				NAME	
				26,958	
				REGISTRATION NUMBER	

09/743668

RADIO COMMUNICATIONS UNITTECHNICAL FIELD

This invention relates to a radio communications unit, and more particularly to a unit which is able to communicate over a radio communications network such as a satellite or cellular system, and is also able to communicate with a device such as a portable handset over a short range radio link.

BACKGROUND OF THE INVENTION

A potential disadvantage with the use of units of the general type mentioned above is that there may be interference signals appearing on the frequency at which the unit communicates with the communication network such as the satellite or cellular network. In particular, signals received on the short range radio link may be a source of such interference.

A problem therefore arises with such units as to how to avoid interference of this type.

SUMMARY OF THE INVENTION

In accordance with the invention, interference on the communications path with the communications network is avoided by detecting the strength of signals received on the short range radio link, and alerting the user if those signals are such as to be a potential source of interference.

In particular, a unit in accordance with the invention comprises a first transceiver for communicating over a communications network such as a cellular or satellite system, and a second transceiver for communicating with a device such as a portable handset over a short range radio link. The unit further comprises means for detecting the signal strength of signals received over the short range radio link, and means for comparing that signal strength with a predetermined threshold. The unit further comprises means for alerting the user in the event that the

threshold is exceeded.

This has the advantage that communications over the short range radio link can then be suspended to avoid the possibility of such interference.

5 BRIEF DESCRIPTION OF DRAWING

Figure 1 is a block schematic diagram of a system in accordance with the invention:

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

10 For a better understanding of the present invention, and to show how it may be put into effect, reference will now be made, by way of example, to the accompanying drawing.

Figure 1 shows a system in accordance with the invention.

15 The system 2 includes a first antenna 4, connected to transceiver circuitry 6, for communication over a radio communications network. In one preferred embodiment of the invention, the transceiver circuitry 6 is adapted for communication over a conventional
20 cellular network, although it may equally be adapted for communication over a satellite network, or indeed any other radio communications network.

25 The unit 2 further comprises a second antenna 8, and transceiver circuitry 10, for communication over a short range radio link. Figure 1 further shows a portable handset 12, having its own antenna 14, for communication over the same link with the unit 2. Although the invention is described herein with
30 reference to communication over the short range radio link with a portable handset 12, it will be appreciated that this device may be any device which is located remotely from the system 2, or at least is moveable relative thereto.

35 For example, the unit 2 may be adapted for communication over a Globalstar satellite network, transmitting on channels in the band from 1610-1627

MHz, and receiving signals from the satellite on channels in the band from 2480-2500 MHz. The short range link can advantageously operate in the internationally recognised ISM band from 2400-2480 MHz, both to transmit and to receive.

The system 2 includes a satellite baseband and control module 7, and a short range link baseband and control module 11. These modules 7, 11 receive data from the respective transceiver circuits 6, 10 and transmit them to the other transceiver circuit via the other module. Moreover, the modules 7, 11 send tuning and power control signals to their respective transceiver circuit 6, 10.

The system 2 further comprises a controlling and interfacing unit 16, which controls the overall operation of the device, and, in particular, sends and receives signals to and from the transceiver units 6, 10.

The control unit 16 includes means for determining the signal strengths of signals received from the remote unit 12 at the transceiver circuitry 10. The object is to determine when the signal from the remote unit 12, received at the system main unit 2, is sufficiently strong to provide a possible source of interference for the reception of signals at the transceiver 6. This may be achieved in different ways.

As a first example, a measurement may be made of the strength of the signal received from the remote unit 12 at the short range receiver circuit 10.

As a second alternative, a measurement may be made of the signal strength of the signal from the remote unit 12 in the main receiver unit 6.

As a third alternative, a measurement may be made in the main receiver unit 6 of the strength of a noise signal at the frequency which that receiver unit is using for reception of signals from the communications

network.

In Figure 1, the control unit 16 is shown as having inputs from both transceiver circuits 6, 10. However, depending on which of these alternatives is used, only one of the inputs may be required.

In the case of this third alternative, it can be determined that any received noise signal is a result of transmissions from the remote unit 12 in different ways.

As a first example, a correlation between the occurrence of a noise signal and a known time at which the remote unit 12 is transmitting may be used as an indication that it is the remote unit 12 which is the source of the noise signal.

As a second example, a correlation between transmissions from the remote unit 12 on particular frequencies, and the occurrence of noise in the receiver unit 6, may be used as an indication that transmissions from the remote unit 12 are the source of the noise signal in the receiver unit 6.

As a third example, signals transmitted from the remote unit 12 may include a code modulated thereon in any convenient way (for example, AM, PM or FM), and the receiver unit 6 may include means for demodulation of such a code for use as an indication that it is transmissions from the remote unit 12 which are the source of noise signals received in the receiver unit 6.

In any case, the detected signal strength is compared with a predetermined threshold, set in each case at a level which is determined on the basis of a signal strength which may be a troublesome source of interference in the receiver unit 6.

If it is determined by the control unit 16, on the basis of signal strength measurements taken on signals received at the receiver unit 6 or the receiver unit

10, as described above, an alerting signal is then generated. In a preferred embodiment of the invention, this alerting signal is generated in the controlling unit 16, sent via the short range link baseband and control module 11 and the transceiver circuit 10, and transmitted across the short range radio link to the remote unit 12. In the remote unit 12, such a signal is converted into an appropriate form of warning to the user of the device. For example, the warning may take the form of an audible message, stored in the remote unit and played back in response to the receipt of an alerting signal, or a visual message, displayed on the display device of the remote unit in response to the receipt of the alerting signal, for example.

Alternatively, since any warning is likely to be issued when the remote unit 12 is close to the main unit 2, it may be acceptable, and technically simpler, for the warning to be generated in the main unit.

Alternatively or, preferably, in addition, the controlling unit can issue a command to prevent further interfering transmissions from the remote unit 12 to the receiver unit 10. For example, if the signal strength of transmissions from the remote unit 12, received at the receiver unit 10, is sufficiently high to be a potential source of interference, this is likely to be because the remote unit 12 is very close to the system main unit 2. In such an event, it is highly probable that it will be acceptable to switch to an infrared communications link between the remote unit 12 and system main unit 2. To that end, in the preferred embodiment of the invention, the system main unit 2 includes an infrared transceiver 18, and the remote unit 12 includes an infrared transceiver 20.

As an alternative, the alerting message to the user may for example request that the user discontinue the use of the radio link and instead switch to a wired

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communication from the remote unit to the system main unit. Again, this may be acceptable if the reason for the interference is that the remote unit has moved close to the system main unit.

5 As a further alternative, the main unit 2 and remote unit 12 may include alternative transceivers, allowing communications to be switched to an alternative radio frequency band, which reduces the possibility of interference.

10 In accordance with a preferred embodiment of the present invention, the circuitry described above may also be used to detect possible sources of interference originating other than in the radio frequency transmissions with the system main unit over the short range link. For example, transmissions over the radio communications network might suffer interference from other communications users, or even from non-communications sources of radio frequency signals such as microwave ovens.

20 The short range receiver unit 10 in the system main unit 2 is arranged to receive signals on channels which could potentially contain unwanted interference signals. Where the short range radio link between the system main unit 2 and the remote unit 12 is a
25 frequency hopped system, the receiver unit 10 may hop to channels which are blocked by strong interference. In this event, the signal level is still measured, and used as a criterion to warn the user. If a strong signal occurs at a time when the error rate on the
30 short range radio link is high, it can be inferred that the source of the signal is an unwanted third party interferer.

35 Alternatively, the receiver unit 6 in the system main unit 2 could be arranged to select channels which are more likely to be interfered with, and could then correlate the received noise signal with that on other

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channels. This would allow an inference to be made about the source of interference.

There is thus described a system which allows the possibility of interference on the main communications link to be reduced.

5

CLAIMS

1. A communications device, comprising:
a first transceiver for communicating over a first communication network;
5 a second transceiver for communicating with a remote unit;
means for detecting signal strengths of potentially interfering signals; and
means for providing an alert signal if the
10 detected signal strengths exceed a predetermined threshold.
2. A communications device as claimed in claim 1, further comprising means for detecting signal strengths of signals received from the remote unit in the first transceiver.
3. A communications device as claimed in claim 1, further comprising means for detecting signal strengths of signals received from the remote unit in the second transceiver.
- 20 4. A communications device as claimed in claim 1, further comprising means for detecting signal strengths of noise signals, caused by transmissions received from the remote unit, in the second transceiver.
- 25 5. A communications device as claimed in claim 4, further comprising means for identifying times at which transmissions are being received from the remote unit, and means for identifying times at which the detected signal strengths of noise signals in the
30 second transceiver exceed a specified level, and means for comparing the identified times.
6. A communications device as claimed in claim 4, further comprising means for identifying times at which transmissions are being received from the remote
35 unit on one or more specified frequencies, and means for identifying times at which the detected signal

strengths of noise signals in the second transceiver exceed a specified level, and means for comparing the identified times.

5 7. A communications device as claimed in claim 4, further comprising means for detecting in the second transceiver a code modulated onto transmissions from the remote unit.

10 8. A communications device as claimed in any preceding claim, comprising means for generating the alerting signal and transmitting it to the remote unit.

9. A communications device as claimed in any preceding claim, further comprising an infrared transceiver, for communicating with the remote unit when an alert signal is generated.

15 10. A communications system, comprising a communications device and a remote unit, the communications device comprising:

a first transceiver for communicating over a first communication network;

20 a second transceiver for communicating with the remote unit;

means for detecting signal strengths of potentially interfering signals; and

25 means for providing an alert signal if the detected signal strengths exceed a predetermined threshold,

and the remote unit comprising a third transceiver for communicating with the communications device.

30 11. A communications system as claimed in claim 10, wherein the communications device comprises means for transmitting the alert signal to the remote unit.

12. A communications system as claimed in claim 11, wherein the remote unit comprises means for storing an audible message and means for playing back the stored audible message in response to a received alert signal.

35

13. A communications system as claimed in claim 11, wherein the remote unit comprises means for displaying a visual message in response to a received alert signal.

5 14. A communications system as claimed in claim 11, wherein the remote unit comprises means for receiving an alert signal, and for ceasing further radio transmissions to the communications device in response thereto.

10 15. A communications system as claimed in claim 14, wherein the communications device and the remote unit each comprise an infrared transceiver, and further comprising means for switching further transmissions to the infrared transceivers in response to an alert
15 signal.

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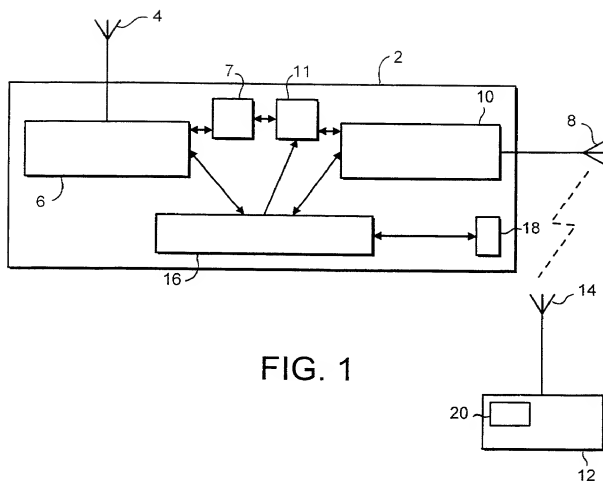


FIG. 1



PATENT APPLICATION
DOCKET NO.: 29206-00030
HL58384/005/DCO/IJM

**RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)
DECLARATION AND POWER OF ATTORNEY**

FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: RADIO COMMUNICATIONS UNIT, the specification of which: (mark only one)

- | | | |
|--------------|-----|--------------------------------------------------------------------------------------------------------------------------------------|
| <u> </u> | (a) | is attached hereto. |
| <u> X </u> | (b) | was filed on <u>10 Jan 2001</u> as Application Serial No. <u>09/743,668</u> and was amended on <u> </u> (if applicable) |
| <u> </u> | (c) | was filed as PCT International Application No. PCT/ <u> </u> on <u> </u> and was amended on <u> </u> (if applicable). |
| <u> </u> | (d) | was filed on <u> </u> as Application Serial No. <u> </u> and was issued a Notice of Allowance on <u> </u> . |
| <u> </u> | (e) | was filed on <u> </u> and bearing attorney docket number <u> </u> |

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the parentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to parentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

<u>Number</u>	<u>Country</u>	<u>Month/Day/Year</u> <u>Filed</u>	<u>Date first</u>	<u>Date</u>	<u>Priority Claimed</u>	
			<u>laid-open or</u> <u>Published</u>	<u>patented or</u> <u>Granted</u>	<u>Yes</u>	<u>No</u>
9815392.7	Great Britain	15 July 1998				X

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

<u>Application No. (series code/serial no.)</u>	<u>Month/Day/Year Filed</u>	<u>Status (pending, abandoned, patented)</u>
PCT/EP99/04665	05 July 1999	Pending

I hereby appoint:

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all of the firm of JENKENS & GILCHRIST, a Professional Corporation, 1445 Ross Avenue, Suite 3200, Dallas, Texas 75202-2799 as my attorneys and/or agents, with full power of substitution and revocation, to prosecute this application, provisionals thereof, continuations, continuations-in-part, divisionals, appeals, reissues, substitutions, and extensions thereof and to transact all business in the United States Patent and Trademark Office connected therewith, to appoint any individuals under an associate power of attorney and to file and prosecute any international patent application filed thereon before any international authorities, and I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct them in writing to the contrary.

Please address all correspondence and direct all telephone calls to:

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214/855-4500
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAMED INVENTOR(S)

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9 Sonning Close Basingstoke Hampshire RG22 5JJ Great Britain		
Post Office Address (include zip code)		

(FOR ADDITIONAL INVENTORS, check here ☐ and add additional sheet for inventor information regarding signature, name, date, citizenship, residence and address)